

GUIDELINES FOR MONITORING STRIPED BASS EGGS,
LARVAE, JUVENILES AND ADULTS
IN COASTAL PROGRAMS

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INTRODUCTION

Since the 1960s, the states of the Gulf of Mexico region have engaged in efforts to restore populations of striped bass which had declined in the 1940s and 1950s. A major activity of those restoration efforts has been, and continues to be, stocking of fry and fingerling striped bass. In order to properly assess the success of stocking efforts, it is necessary to conduct monitoring programs, an activity in which both the states and the federal government have participated. Monitoring is also necessary to assess spawning and stock condition. Lukens (1989) described the striped bass monitoring programs in effect as of 1989. This paper establishes minimum guidelines for monitoring programs for all life stages of striped bass.

For the purpose of establishing methodologies for monitoring of different life stages of striped bass, guidelines are discussed by size category. Three general categories are established. Category I includes eggs and larvae up to 12 millimeters (mm) total length (TL). Category II includes fish from 13 mm TL to 100 mm TL, while Category III includes fish over 100 mm TL.

CATEGORY I: Eggs and Larvae to 12 mm TL

Sampling Gear

- Employ nylon bongo nets or meter plankton nets.
- Mesh size should be no larger than 333 microns (Bruce Comyns, personal communication).
- Flow meters should be used to determine the volume of water sampled. The General Oceanics Model 2030R (mechanical) is a recommended model as it is streamlined and seldom becomes fouled, even in detritus-laden water.
- Oblique tows, with nets deployed surface to bottom, are recommended so that all strata are sampled.

Sampling Locations

- Select sampling locations downstream of suspected or known spawning sites by using stream flow rates and suspected time of spawning to estimate where eggs or larvae may occur.

- For relatively short rivers or streams, sample above, at, and below the saltwater/freshwater interface.

Time of Year

- Sampling should begin when water temperatures are from 15° centigrade (C) to 19°C (Raney 1982).
- Sampling should bracket the spawning season, generally thought to be March through May.

This should make it possible to identify spawning grounds, define the spawning season, estimate the total number of eggs spawned, and estimate spawning stock biomass.

Time of Day

- In the presence of adult striped bass in a reproductively ripe condition, sample in four to six hour intervals over 24 hours or until cessation of spawning is suspected.
- Opportunistically, sample during the daylight hours, beginning immediately following sun rise.

Sampling Frequency

- Sampling should occur as often as funding and manpower will allow.
- Under funding and manpower constraints, sample during periods suspected to be optimum for spawning.

Data Recorded

- Water Temperature (surface and bottom where appropriate)
- Dissolved Oxygen (surface and bottom where appropriate)
- pH (surface and bottom where appropriate)
- Turbidity
- Salinity (surface and bottom where appropriate)
- River Velocity
- Volume of Water Sampled
- Water Depth
- Bottom Type

Preparation of Samples

- Samples should be standardized volumetrically.
- Samples should be placed in 946 milliliter (ml) (one quart) plastic, wide-mouthed, specimen jars and filled to capacity before sealing.
- Samples should be preserved in a seven percent buffered formalin solution.

CATEGORY II: 13 mm - 100 mm TL

Sampling Gear

- Primary sampling gear should be the beach or bag seine.
- Recommended mesh size is five millimeters (mm) or one quarter inch bar mesh.
- When seining is not possible sample using electrofishing or trawling.

Sampling Locations

- Shoreline areas suitable for deploying a seine are recommended for sampling locations.
- Some location characteristics include sand bars, sandy substrate with some flow, and the back sides of sand bar points in the mouths of small creeks.

Time of Year

- If monitoring stocked fish, sampling should begin soon after stocking has occurred. This would probably occur in June.
- To document natural reproduction, sampling should occur prior to stocking of hatchery-reared and stocked fish.
- In areas where Morone hybrids are present, sampling should be delayed until early fall when discrimination of Morone hybrids and striped bass can be accomplished.

Time of Day

- Sampling should be conducted at night.

Sampling Frequency

- To document occurrence, sampling should be conducted as often as funds and manpower will allow.
- To monitor growth and condition factors, sampling can be conducted on a periodic schedule.
- To establish a relative index for stocking programs or levels of natural recruitment, sampling should be conducted as often as possible in a short time frame to allow for statistical analysis.

Data Recorded

Physical

- Water Temperature (surface and bottom where appropriate)
- Salinity (surface and bottom where appropriate)
- pH (surface and bottom where appropriate)
- Dissolved Oxygen (surface and bottom where appropriate)
- River Velocity
- Turbidity
- Water Depth
- Bottom Type

Biological

- Length (Total length. Standard length can be measured as appropriate and for comparison with historical data.)
- Weight
- Stomach Contents
- Otoliths
- Blood
- Lateral Line Scale Counts
- Associated Fish Species

Preparation of Samples

- Fish samples should be preserved in five percent formalin and later transferred to a ten percent alcohol solution.
- If fish are not to be preserved, they may be anesthetized and kept alive or placed on ice unless otoliths are to be analyzed.

CATEGORY III: > 100 mm TL

Sampling Gear

- Monofilament gill nets are recommended for sampling.

- To maximize collection of fish of various sizes, a gill net with multiple panels should be used with mesh sizes ranging from 37.5 mm to 152.0 mm.
- Gill net length and depth may vary.
- Other types of sampling gear include electrofishing, trawls, hook-and-line, and bag and beach seines.
- Creel surveys and voluntary reporting from anglers can be used to obtain life history data.

Sampling Locations

- Sampling locations should include sand bars, creek mouths, and river channels with some velocity.
- Submerged vegetation should be avoided.
- During spring and summer periods, areas of known thermal discharge (springs) should be sampled, along with areas where water temperatures are significantly lower than ambient water temperatures.
- For creel surveys, sampling should be conducted at boat access sites, wade fishing areas, bank fishing areas, piers, and jetties.

Time of Year

- Gill nets should be used during spring and fall.
- Bag or beach seine sampling can be conducted monthly, year round.
- Creel sampling can be done year round with emphasis during peak periods when fishing activity is high.

Time of Day

- All sampling using nets should be conducted at night.
- Electrofishing and hook-and-line sampling can be conducted in the day time.
- Creel surveys should be conducted in the day time, unless it is known that significant recreational angling is occurring at night.

Sampling Frequency

- Gill nets and electrofishing should be conducted as often as funding and manpower will allow to allow for statistical analysis between years and to meet study objectives.
- Creel surveys should be weighted to reflect angler activity.

Data Recorded

Physical

- Water Temperature (surface and bottom where appropriate)
- Salinity (surface and bottom where appropriate)
- pH (surface and bottom where appropriate)
- Dissolved Oxygen (surface and bottom where appropriate)
- River Velocity
- Turbidity
- Water Depth
- Bottom Type

Biological

- Length (Total length. Standard length can be measured as appropriate and for comparison with historical data.)
- Weight
- Stomach Contents
- Otoliths
- Blood
- Lateral Line Scale Counts
- Associated Fish Species

Preparation of Samples

- Samples collected by any method may be held on ice until analyzed. Otoliths and internal organs may be removed and analyzed or preserved appropriately for later analysis.
- Samples collected by electrofishing are anesthetized, measured, weighed, and released if live release is intended.
- Live release of specimens offers an opportunity to insert a tag.

DISCUSSION

The categories used in this document were devised to accommodate sampling gears used to collect the various life stages of striped bass and based on behavior of the fish during those life stages. They are not intended to create new terms to describe the various life stages of striped bass.

It is important to the success of the Gulf States Marine Fisheries Commission's state-federal cooperative program to restore and manage striped bass in the Gulf of Mexico region that monitoring and sampling procedures used to assess striped bass be standardized. This assures comparability of results across all state and federal activities.

These guidelines are in no way to be construed as all inclusive, nor does acceptance of this document bind any agency to these parameters or techniques alone. Consideration, however, must be given to the cooperative nature of the program and the benefits to be gained from standardization of sampling procedures.

LITERATURE CITED

- Lukens, R. R. 1989. A Profile of State and Federal Sampling Programs for Eggs, Larvae, and Juveniles of Striped Bass. Gulf States Marine Fisheries Commission, Special Report No. 6-WB. 19 pp.

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